



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/063,004	03/11/2002	Thomas Paul Feist	08CN8803-26	4708

23413 7590 05/21/2003

CANTOR COLBURN, LLP
55 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

EXAMINER

BERNATZ, KEVIN M

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 05/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

10/063,004

Applicant(s)

FEIST ET AL.

Examin r

Kevin M Bernatz

Art Unit

1773

-- The MAILING DATE of this communication appears on th cover sheet with th correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2-5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Examiner's Comments

1. Claims 10, 11, 26 – 28, 35 and 36 recite additional limitations pertaining to a specific Markush element (e.g. claim 10 depends from claim 1, which recites the Markush group “a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s)”). However, the above noted claims do not positively recite that the specific element must be selected, and therefore, the limitations in the dependent claims are not required unless the specific Markush element is included. Applicant(s) are suggested to reword the claims to positively recite the selection of the specific Markush group element first, and then further limit said element (e.g. “wherein the styrene material is a styrenic copolymer(s) and the styrenic copolymer(s) is prepared by ...”). See also claim 12 for suggested wording to positively recite that the limitations are included.
2. The wording of claim 19 is slightly confusing, but has not been deemed indefinite based upon applicants' disclosure. Specifically, the wording of claim 19 implies that the styrenic material includes three components: one selected from the Markush group listed in claim 1, and further comprising 25 – 90 wt% polystyrene and 10 to 75 wt% styrenic copolymers. Based upon applicants' disclosure, the Examiner notes that the claim appears to refer to embodiments wherein the styrenic material is made up of at least 2 components: 25 – 90 wt% PS and 10 – 75 wt% styrenic copolymers (see

Paragraphs 0017 and 0019). Removal of the word "further" in line 1 would be sufficient to clarify the claim language.

3. Claims 22 and 30 recite the limitation "the reaction product of poly(arylene ether) and a styrene material", yet applicants' disclosure is not directed to a reaction between these two materials, but rather a blend of the polymers (*see applicants' disclosure: Paragraphs 0016, 0019, 0029, 0030, 0032, 0033 and Examples*). The Examiner notes that a "reaction product", as known to one of ordinary skill in the art, results in a chemical change and/or covalent bonding, while a "blend" does not alter the chemical make-up of the components but results in a single or multiple phase material through micellular interaction, entanglements and/or van der Waal forces. Therefore, the limitation "reaction product of ..." has been interpreted to read on "blends", based on applicants' disclosure.

Claim Objections

4. Claim 20 is objected to because of the following informalities: remove the extra "and" after comprises (line 2) and insert a space between "90 and "wt%" (also line 2). Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 4 – 7, 12, 23 – 26, 33 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It has been found that the phrase “less than about” is indefinite barring a showing in the specification as to what values around the endpoint are envisioned to be encompassed by the word “about”. *Ex parte Lee*, 31 USPQ2d 1105 (BdPatApp&Int. 1993). In the instant case, applicant(s) have used the **mathematical expression** “less than about” (or its equivalents), namely “less than or equal to about”. In all cases, the phrases used have **exact** meanings (i.e. “greater than X” and/or “less than X”) which are combined with a **non-exact** modifier (i.e. “about”). As such, the expressions are indefinite since the exact expression(s) “less than or equal to” require(s) an exact endpoint and the modifier “about” removes that exact endpoint. Only in cases where it is clear from provided experimental data what the “about” is intended to encompass are the phrases “less than about” or “greater than about” (or their equivalents) considered definite. The examiner recommends using non mathematically exact expressions such as “about X, or less” or “about X, or more”.

As an example to better illustrate the Office’s position, applicants should consider the following. The limitation “less than 10”, clearly covers a range of “any value less than the value of 10, **excluding** 10”. “Less than or equal to 10”, clearly covers a range

of “any value less than the value of 10, **including** 10”. These limitations are not equivalent in that one provides more coverage than the other (i.e. a value of exactly 10 would only infringe on the latter limitation). Less than “about 10” is indefinite because it isn’t clear if the “about 10” implies values on the side already provided for by the “less than” part (i.e. an equivalent expression to “less than 9.993” instead of “less than 10”) or if it is attempting to gain additional coverage by both **including** 10 and then some (i.e. an equivalent expression to “less than 10.0234” instead of “less than or equal to 10”). Since the specification does not provide guidance as to what the “about” covers, the claim is indefinite in terms of U.S.C. 112 2nd Paragraph since one of ordinary skill could not reasonably ascertain the full scope of the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 3 – 20, 22 – 28 and 30 – 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funaki et al. (U.S. Patent No. 5,374,462) in view of Traugott et al. (U.S. Patent No. 4,885,339) and “Plastics Materials” (7th Ed., pages 584 – 592).

Regarding claims 1, 22 and 30 - 32, Funaki et al. disclose a rotatable storage media for data (*col. 1, lines 5 – 14*), comprising a substrate comprising at least one single phase plastic resin portion (*col. 3, lines 32 – 37*), wherein the plastic resin

portion comprises a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s) (*col. 3, lines 32 – 37; col. 5, lines 32 – 39 and col. 6, lines 44 – 45*), and at least one data layer on the substrate (*Example 16*); wherein the data layer can be at least partly read from, written to, or a combination thereof by at least one energy field, and wherein, when the energy field contacts the storage media, the energy field is incident upon the data layer before it could be incident upon the substrate (*Example 16, wherein the energy field is a magnetic field and since both sides of the substrate are covered by the magnetic layer, the magnetic field must be incident upon the data layer before it could be incident upon the substrate*).

While Funaki et al. discloses that poly(arylene ether) [PAE] can be blended with the styrene (i.e. a “reaction product of PAE and a styrene material”) (*col. 9, lines 1 – 11*), Funaki et al. fails to explicitly disclose an embodiment possessing such a combination, nor render sufficient motivation to select such a material from the list of possible additives to the polystyrene substrate.

However, Traugott et al. teach that blending PAE to styrenic polymers (i.e. “a reaction product of PAE and a styrene material”) results in a material having high heat and impact resistance, low moisture absorption and improved processability since the two polymers are “substantially completely compatible” (*col. 1, lines 9 - 42*). In addition, “Plastics Materials” further teaches that the combination of polyphenylene ethers with polystyrene is old in the art (*Table 21.1 and pages 589 – 592*) and produces an engineering polymer possessing good dimensional stability, low water

Art Unit: 1773

absorption, excellent resistance to hydrolysis, good dielectric properties and a high heat distortion temperature.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Funaki et al. to blend PAE with the styrenic polymers as taught by Traugott et al. and "Plastics Materials" (and also referred to by Funaki et al.), since such a combination would produce a polymer having high heat and impact resistance, low moisture absorption and improved processability.

Regarding claims 3 - 6, 23 - 25, 33 and 34, Funaki et al. disclose polystyrene molecular weights meeting applicants' claimed limitations (*col. 6, lines 58 - 67*), but both Funaki et al. and Traugott et al. fail to disclose molecular weights of PAE meeting applicants' claimed limitations. However, the Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the PAE molecular weight (and molecular weight distribution) through routine experimentation, especially given the teachings in Funaki et al. and Traugott et al. regarding the effect of molecular weight on the film properties (*Funaki et al.: col. 6, lines 58 - 67; Traugott et al.: col. 2, lines 43 - 54*), as well as the teaching in "Plastics Materials" regarding known molecular weight ranges for polyphenylene ethers (*section 21.5.1: "25,000 - 60,000"*). *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant(s) invention to modify the device of Funaki et al. to use a PAE comprising a molecular weight (and molecular weight distribution) meeting applicant(s)

claimed limitations, since the optimization of a known cause-effective variable is within the capabilities of one having ordinary skill in the art.

Regarding claims 7 – 9, the Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the relative amounts of styrene material to PAE through routine experimentation, especially given the teachings in Traugott et al. regarding the relative percentages of the two materials used in the art (*col. 1, lines 53 – 57 and examples*). It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant(s) invention to modify the device of Funaki et al. to use a weight percent styrene material and PAE meeting applicant(s) claimed limitations, since the optimization of a known cause-effective variable is within the capabilities of one having ordinary skill in the art.

Regarding claims 10, 11, 26 – 28, 35 and 36, since Traugott et al. disclose embodiments comprising polystyrene and PAE, the limitations directed to the “styrenic copolymer” are not required in the above identified claims (see Paragraph 1, above).

Regarding claims 12 – 14, Funaki et al. disclose embodiments comprising styrenic copolymers in amounts meeting applicants’ claimed limitations (*col. 6, lines 32 – 37 and 48 – 57*). Furthermore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the amount of co-monomer through routine experimentation, especially given the teaching in Funaki et al. regarding the desired amount of styrenic monomer desired to insure the beneficial properties of the styrene material. It would

therefore have been obvious to one of ordinary skill in the art at the time of the applicant(s) invention to modify the device of Funaki et al. to use an amount of co-monomer meeting applicant(s) claimed limitations, since the optimization of a known cause-effective variable is within the capabilities of one having ordinary skill in the art.

Regarding claim 15, Funaki et al. disclose co-monomers meeting applicants' claimed limitations (*col. 6, lines 56 – 57*).

Regarding claims 16 – 18, Funaki et al. disclose additives meeting applicants' claimed limitations (*col. 7, line 58 bridging col. 9, line 7; col. 12, lines 1 – 46; and Examples*).

Regarding claims 19 and 20, Funaki et al. disclose that mixtures of styrene materials are encompassed by the disclosed invention (*col. 6, lines 27 – 32*), though Funaki et al. fails to explicitly disclose mixing polystyrene with a copolymer of styrene.

However, Traugott et al. explicitly teach that ternary compounds comprising PAE, polystyrene and polystyrene copolymers can be produced, wherein the amount of copolymer added is controlled to within applicants' claimed composition ranges in order to optimize the mechanical properties of the film (*col. 5, lines 6 – 23*). The Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the relative amounts of polystyrene to styrene co-polymer through routine experimentation, especially given the teaching in Traugott et al. regarding the known percentages of copolymer added to ternary PAE-polystyrene-copolymer mixtures.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant(s) invention to modify the device of Funaki et al. to use a relative composition of polystyrene and styrene co-polymer meeting applicant(s) claimed limitations, since the optimization of a known cause-effective variable is within the capabilities of one having ordinary skill in the art.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funaki et al. in view of Traugott et al. and "Plastics Materials" as applied above, and further in view of applicants' admissions.

Funaki et al. in view of Traugott et al. and "Plastics Materials" is relied upon as described above.

None of above disclose surface features meeting applicants' claimed limitations.

However, applicants admit that it is old in the art to utilize surface features meeting the claimed limitations to facilitate the tracking of the read/write device (*Paragraph 0006*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Funaki et al. in view of Traugott et al. and "Plastics Materials" to utilize surface features meeting applicants' claimed limitations since such limitations are admitted by applicants' as old in the art for facilitating the tracking of the read/write device.

10. Claims 21, 29 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funaki et al. in view of Traugott et al. and "Plastics Materials" as applied above, and further in view of Zarnoch et al. (U.S. Patent App. No. 2002/0173597), Job et al. (U.S. Patent No. 4,851,455), article titled "Viscosity of Linear Polyesters. An Exact Relationship between Viscosity and Chain Length" by P. Flory, and applicants' admissions.

Funaki et al. in view of Traugott et al. and "Plastics Materials" is relied upon as described above.

None of the above disclose the intrinsic viscosity meeting applicants' claimed limitations.

However, the intrinsic viscosity is a known cause-effective variable related to the viscosity of the polymer and effects the processability and transport characteristics of the polymer. Furthermore, Zarnoch et al. teach that PAE is known to possess intrinsic viscosity values meeting applicants' claimed limitations (*Paragraph 0039*), Job et al. teach that it is known that the reduced viscosity of PAE can be varied (*col. 4, lines 34 - 39*), and applicants' admit that "poly (arylene ether) generally has an intrinsic viscosity of about 0.10 to about 0.60 deciliters per gram (dl/g) as measured in chloroform at 25 °C" (*Paragraph 0023*).

The Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the intrinsic viscosity of the PAE through routine experimentation, especially given the

teachings above regarding the known values of viscosity and the fact that the various viscosity measurements are related to each other (*see article by P. Flory*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant(s) invention to modify the device of Funaki et al. in view of Traugott et al. and "Plastics Materials" to use a PAE possessing an intrinsic viscosity meeting applicant(s) claimed limitation, since the optimization of a known cause-effective variable is within the capabilities of one having ordinary skill in the art.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lau et al. (U.S. Patent No. RE37,599 E) teach known molecular weight ranges for poly(arylene ether) (*col. 16, lines 63 - 67*). Jabloner et al. (U.S. Patent No. 4,789,722) also teach known molecular weight ranges for poly(arylene ether) (*col. 7, lines 33 - 40*).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Art Unit: 1773

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

KMB

KMB
May 15, 2003


Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700